

Claims

1. The method for sterilizing materials comprising the steps of:
 - (a) providing a multi-channel linear induction accelerator system having an output of select electron beam energy and direction;
 - 5 (b) providing an output assembly coupled in vacuum secure relationship with said linear induction accelerator system for transferring said output of select energy therefrom in a predetermined direction;
 - (c) manipulating said output from said output assembly to distribute it over a treatment region of controlled extent and with a distribution of
 - 10 output energy effective to non-destructively sterilize said material; and
 - (d) transporting said material through said treatment region.
2. The method of claim 1 in which:
 - said step (a) provides said multi-channel linear induction accelerator
 - 15 system as having a single channel with said output being present as a single beam; and
 - said step (c) manipulates said single beam by magnetically causing it to successively sweep across said treatment region.
- 20 3. The method of claim 2 in which said step (c) manipulates said output to provide a hard X-ray output.
4. The method of claim 1 in which:
 - said step (a) provides said multi-channel linear inductor accelerator
 - 25 system as having more than one channel, each providing a channel-designated discrete said output; and
 - said step (c) manipulates each said channel-designated output by magnetically causing it to sweep across that said treatment region associated with said channel-designated output.
- 30 5. The method of claim 4 in which said step (c) manipulates at least one said channel-designated output to provide a hard X-ray output.

6. The method of claim 1 in which:
said step (a) provides said multi-channel linear accelerator induction
system as having more than one channel, each providing a channel-designated
5 discrete said output; and

said step (c) manipulates each said channel-designated output by
defocusing it to derive an expanded channel-designated output at said treatment
region in a manner wherein said channel-designated outputs of adjacent said
channels are caused to overlap and mutually extend over said treatment region.

10 7. The method of claim 6 in which said step (c) manipulates at least one
said channel-designated output to provide a hard X-ray output.

8. The method of claim 6 in which:
15 said step (c) manipulates each said channel-designated output by
azimuthally-symmetrically defocusing it.

9. The method of claim 6 in which:
said step (c) manipulates each said channel-designated output by
20 azimuthally-asymmetrically defocusing it.

10. The method of claim 1 in which:
said step (a) provides said multi-channel linear induction accelerator
system as having more than one channel, each said channel providing a channel-
25 designated discrete said output having a said select direction which is generally
horizontal; and

said step (b) provides said output assembly as transferring said output
in a said predetermined direction which is generally horizontal.

30 11. The method of claim 10 in which said step (c) manipulates at least
one said channel-designated output to provide a hard X-ray output.

12. The method of claim 10 in which said step (c) manipulates each said channel-designated output by defocusing it to derive an expanded channel-designated output at said treatment region in a manner wherein said channel-designated output of adjacent said channels are caused to overlap and mutually
5 extend over said treatment region.

13. The method of claim 12 in which:
said step (c) manipulates each said channel-designated output by azimuthally-symmetrically defocusing it.
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14. The method of claim 12 in which:
said step (c) manipulates each said channel-designated output by azimuthally-asymmetrically defocusing it.

15. The method of claim 1 in which:
said step (a) provides said multi-channel linear induction accelerator system as having more than one channel, each said channel providing a channel-designated discrete said output having a said select direction which is generally horizontal;
20 said step (b) provides said output assembly with a said predetermined direction which is generally horizontal; and
said step (d) transports said material generally vertically through said treatment region.

16. The method of claim 15 in which said step (c) manipulates at least one said channel-designated output to provide a hard X-ray output.
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17. The method of claim 15 in which said step (c) manipulates each said channel-designated output by defocusing it to derive an expanded channel-designated output at said treatment region in a manner wherein said channel-designated outputs of adjacent said channels are caused to overlap and mutually
30 extend over said treatment region.

18. The method of claim 17 in which:
said step (c) manipulates each said channel-designated output by azimuthally-symmetrically defocusing it.

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19. The method of claim 17 in which:
said step (c) manipulates each said channel-designated output by azimuthally-asymmetrically defocusing it.

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Variable	Mean	SD	Min	Max
Age	21.1	1.8	18	24
Gender	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	1.2	0.8	0.5	2.5
Health	1.5	0.5	1	2
Family size	3.5	1.5	2	6
Urban/rural	0.5	0.5	0	1
Employment	0.5	0.5	0	1
Marital status	0.1	0.3	0	1
Religion	0.5	0.5	0	1
Education	12.5	1.5		